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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,801	07/23/2003	Anthony C. Zuppero	22122878-70	9026
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BAKER & MCKENZIE 805 THIRD AVENUE NEW YORK, NY 10022				
EXAMINER DIAMOND, ALAN D				
ART UNIT		PAPER NUMBER		
1753				

DATE MAILED: 11/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

MR2

**Office Action Summary**

Application No.

10/625,801

Applicant(s)

ZUPPERO ET AL.

Examiner

Alan Diamond

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 September 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 32-50, 52-54, 56-89 and 92 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 32-50, 52-54, 56-89 and 92 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Comments***

1. The Examiner acknowledges that the priority data on page 1 of the instant specification has been clarified and updated.
2. The objection to claim 46 for informalities has been overcome by Applicant's amendment thereof.
3. The Examiner acknowledges that claims 51, 55, 90, and 91 have been cancelled. Accordingly, all rejections of these claims are now moot.
4. The 35 USC 112, second paragraph, rejection of claims 36-38 have been overcome by Applicant's amendment of the claims.
5. The Examiner has reviewed Serial Nos. 09/631,463 and 10/759,341 referred to by Applicant on page 15 of the Amendment filed September 7, 2004.

### ***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:  

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
7. Claims 33, 36-38, 42, 78, and 80 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claim 33, the “tailoring one or more properties of the semiconductor diode to enhance one-way transport of the electrons in the thin electrically conducting surface to the one or more semiconductor elements” is not supported by the specification, as originally filed.

In claims 36-38, the doping range using  $10^{15}$  and  $10^{18}$  per cubic centimeter as the lower and upper limits is not supported by the specification, as originally filed

In claim 42, at line 2, the “approximately match” is not supported by the specification, as originally filed.

In claim 78, at line 2, the term “substantially flat” is not supported by the specification, as originally filed.

In claim 80, at line 2, the term “substantially stepped” is not supported by the specification, as originally filed.

With respect to claim 33, Applicant argues that “the specification describes various illustrative ways to tailor properties of a semiconductor diode.” Applicant argues that “page 11 (e.g., lines 11-17) describes tailoring the bandgap and doping levels which are examples of properties of a semiconductor”, and that “[t]hese properties permit adjusting of the Fermi levels, which for example, affect the ability to capture electrons from the metal into the semiconductor.” Applicant argues that “[p]age 12 also describes modifying the Schottky barrier properties, for example, for enhancing one-way transmission.” However, these arguments are not deemed to be persuasive because tailoring bandgap and doping levels, and modifying Schottky barrier properties, is not sufficient support for “one or more properties”. The upper limit of “one or more” is

practically limitless, and the disclosure of two or three properties does not support a practically limitless number.

Applicant argues that “[t]o one skilled in the art, as referred to in technical papers in this technology,  $10^{15}$  per cc is considered a low doping” and “ $10^{18}$  per cc is considered high doping, also referred to as degenerative doping.” Applicant cites MPEP 2163.02 and argues that the subject matter of a claim need to be described literally. However, this argument is not deemed to be persuasive because there are many other levels of doping that are also considered low, high, or degenerative doping. There is nothing in the specification, or for that matter, the prior art, that would have led a skilled artisan to the select the particular doping range using  $10^{15}$  and  $10^{18}$  per cubic centimeter for the lower and upper limits. Furthermore, Applicant should provide copies of the technical papers that are being referred to.

With respect to claim 42, Applicant argues that the “specification on page 11, lines 22-28 discloses that conduction band of the semiconductor may match an energy level of the adsorbates on the conducting surface, and how bias may be used to do so.” Applicant argues that the “[s]pecification on page 13 lines 26-31 also discloses that one resonance may overlap another, or for instance, that the band center of one is within the band of the other, implying ‘approximately match’ to one skilled in the art.” However, this argument is not deemed to be persuasive because page 11, lines 22-28, and page 13, lines 26-31 are silent concerning the minima of the potential wells. Page 13, lines 26-31, refer to unpopulated electron excitation states of the substrate, and excitation transfer due to energized products, but there is nothing on page 11 or page 13, or the

rest of the specification that leads a skilled artisan to approximately match said minima and the excitation energy of the reaction products.

With respect to claims 78 and 80, applicant argues that "the specification on page 13, line 13 discloses using one to tens of atomic metal monolayers of metal to form the conducting surface" and that the specification also discloses "using quantum wells on the surface." Applicant argues that "[m]onolayers and quantum wells, for example, are known to those skilled in the art to be substantially flat." Applicant also argues that the "[s]pecification on page 13, lines 14-25 discloses that reaction surface geometries, for example, may include steps and/or edge sites." However, these arguments are not deemed to be persuasive because the terms "substantially flat" and "substantially stepped" were never defined, or for that matter, ever even mentioned in the originally filed specification. Both terms are subjective and nothing in the originally filed disclosure supports them.

***Claim Rejections - 35 USC § 112***

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 78 and 80 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 78, at line 2, the term "substantially flat" is indefinite because it is subjective.

In claim 80, at line 2, the term "substantially stepped" is indefinite because it is subjective.

Applicant argues that according to MPEP 2173.ob(b), the specification can provide general guidelines to render a limitation that contains the word "substantially" definite. Applicant argues that the terms "substantially flat" and "substantially stepped" are definite "in view of the specification in the instant application that discloses that the conducting surface or catalysts may be formed, for example, as (but not limited to) steps, edges, clumps, monolayers, clusters, ridges, quantum dots, quantum wells, or quantum stadia." However, this argument is not deemed to be persuasive because the terms "substantially flat" and "substantially stepped" were never even mentioned in the originally filed specification, and thus, there is no guidance as to the meaning of these terms. It is not clear how close to being flat the conducting surface must be in order to be considered "substantially flat". Likewise, it is not clear how close to being stepped the conducting surface must be in order to be considered "substantially stepped. Said "steps, edges, clumps, monolayers, clusters, ridges, quantum dots, quantum wells, or quantum stadia" do not provide support for or give sufficient guidance so as to define what is to be encompassed by said terms.

### ***Double Patenting***

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claims 32-50, 52-54, 56-89, and 92 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-16 of U.S. Patent No. 6,114,620. Although the conflicting claims are not identical, they are not patentably distinct from each other because the method and device in the claims of said patent perform the instant method.
12. Claims 32-50, 52-54, 56-89, and 92 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,218,608. Although the conflicting claims are not identical, they are not patentably distinct from each other because the method in the claims of said patent performs the instant method.
13. Claims 32-50, 52-54, 56-89, and 92 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-6 of U.S. Patent No. 6,222,116. Although the conflicting claims are not identical, they are not patentably distinct from each other because when preparing and using the device in the claims of said patent, the instant method will be performed.
14. Claims 32-50, 52-54, 56-89, and 92 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-74 of U.S. Patent No. 6,268,560. Although the conflicting claims are not identical, they are



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not patentably distinct from each other because the method and device in the claims of said patent perform the instant method.

15. Claims 32-50, 52-54, 56-89, and 92 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-10 of U.S. Patent No. 6,327,859. Although the conflicting claims are not identical, they are not patentably distinct from each other because the method and device in the claims of said patent perform the instant method.

16. Claims 32-50, 52-54, 56-89, and 92 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-37 of U.S. Patent No. 6,649,823. Although the conflicting claims are not identical, they are not patentably distinct from each other because the method and device in the claims of said patent perform the instant method.

17. Claims 32-50, 52-54, 56-89, and 92 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-9 of U.S. Patent No. 6,678,305. Although the conflicting claims are not identical, they are not patentably distinct from each other because the method in the claims of said patent performs the instant method.

18. Claims 32-50, 52-54, 56-89, and 92 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-9 of U.S. Patent No. 6,700,056. Although the conflicting claims are not identical, they are not patentably distinct from each other because the method in the claims of said patent performs the instant method.

19. Claims 32-50, 52-54, 56-89, and 92 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-48 of copending Application No. 09/682,363. Although the conflicting claims are not identical, they are not patentably distinct from each other because the method and device in the claims of said copending application perform the instant method.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

20. Claims 32-50, 52-54, 56-89, and 92 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-29 of copending Application No. 10/052,004. Although the conflicting claims are not identical, they are not patentably distinct from each other because the method and device in the claims of said copending application perform the instant method.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

21. Claims 32-50, 52-54, 56-89, and 92 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-30 of copending Application No. 10/185,086. Although the conflicting claims are not identical, they are not patentably distinct from each other because the method and device in the claims of said copending application perform the instant method.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

22. Claims 32-50, 52-54, 56-89, and 92 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-8 and 34-73 of copending Application No. 10/218,706. Although the conflicting claims are not identical, they are not patentably distinct from each other because the method in the claims of said copending application performs the instant method.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Response to Arguments***

23. Applicant's arguments filed September 7, 2004 have been fully considered but they are not persuasive. Applicant argues that the present application is not obvious over the claimes recited in those patents and copending applications relied upon by the Examiner in the double patenting rejections. However, this argument is not deemed to be persuasive because the Examiner maintains that the instant claims are obvious over the claims of said patents and copending applications.

### ***Conclusion***

24. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

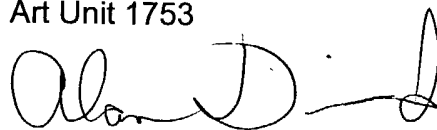
25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan Diamond whose telephone number is 571-272-1338. The examiner can normally be reached on Monday through Friday, 5:30 a.m. to 2:00 p.m. ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alan Diamond  
November 5, 2004

Alan Diamond  
Primary Examiner  
Art Unit 1753

A handwritten signature in black ink, appearing to read 'Alan D. Diamond', with a stylized flourish at the end.